Guide to the Permian Reef Geology Trail, McKittrick Canyon, Guadalupe Mountains National Park, West Texas
edited by D.G. Bebout and C. Kerans ..... (4) 935
Origin, Diagenesis and Petrophysics of Clay Minerals in Sandstones
edited by D.W. Houseknecht and E.D. Pittman ..... (1) 156
Phanerozoic Sea-Level Changes
by Anthony Hallam ..... (4) 935
Sedimentary Petrography
by A.V. Carozzi ..... (1) 156
The Geological Modelling of Hydrocarbon Reservoirs and Outcrop Analogues
edited by S.S. Flint and I.D. Bryant ..... (2) 419

CONTENTS INDEX TO VOLUME A64

Volume A64, No. 1, January 1994

THE EDITOR'S PAGE 1

ARTICLES

Provenance analysis of muddy sandstones ..... **Carol Bangs Rooney and Abhijit Basu** 2

Source versus depositional controls on sandstone composition in a foreland basin: the El Imperial Formation (mid-Carboniferous–Lower Permian), San Rafael Basin, western Argentina ..... **Irene S. Espejo and Oscar R. López-Gamundí** 8

Holocene and Paleogene arkoses of the Massif Central, France: mineralogy, chemistry, provenance, and hydrothermal alteration of the type arkose ..... **Peter C. van de Kamp, Kenneth P. Helmold, and Bernard E. Leake** 17

Antidunes and traction-carpet deposits in deep-water channel sandstones, Cretaceous, British Columbia, Canada ..... **Koji Yagishita** 34

The influence of lateral basinal slopes on turbidite sedimentation in the Annot sandstones of SE France ..... **H.D. Sinclair** 42

Carbonate pseudomatrix in siliciclastic-carbonate turbidites from the Oquirrh–Wood River Basin, southern Idaho ..... **Jeffrey K. Geslin** 55

Scaling in turbidite deposition ..... **Daniel H. Rothman, John P. Grotzinger, and Peter Flemings** 59

Downstream changes in the lithology and grain size of fluvial gravels, the Watarase River, Japan: evidence of the role of abrasion in downstream fining ..... **Yoshinori Kodama** 68

Experimental study of abrasion and its role in producing downstream fining in gravel-bed rivers ..... **Yoshinori Kodama** 76

The angular deviation of paleocurrent directions as applied to the calculation of channel sinuosities ..... **J.P. le Roux** 86

Origin of satin spar veins in evaporite basins ..... **Thomas C. Gustavson, Susan D. Hovorka, and Alan R. Dutton** 88

The occurrence of authigenic minerals in solid bitumens .. **J. Parnell, P.F. Carey, and S.H. Bottrell** 95

Paleoceanographic and paleoclimatic controls on ooid mineralogy of the Smackover Formation, Mississippi salt basin: implications for Late Jurassic seawater composition ..... **Ezat Heydari and Clyde H. Moore** 101

An ion microprobe study of diagenetic carbonates in the Devonian Nisku formation of Alberta, Canada ..... **Lee R. Riciputi, Hans G. Machel, and David R. Cole** 115

Numerical models of fluid flow in carbonate platforms: implications for dolomitization ..... **Jonathan Kaufman** 128

Irregular fenestrae in Bahamian eolianites: a rainstorm-induced origin ..... **Roger J. Bain and Pascal Kindler** 140

Guide to the Permian Reef Geology Trail, McKittrick Canyon, Guadalupe Mountains National Park, West Texas
edited by D.G. Bebout and C. Kerans ..... (4) 935
Origin, Diagenesis and Petrophysics of Clay Minerals in Sandstones
edited by D.W. Houseknecht and E.D. Pittman ..... (1) 156
Phanerozoic Sea-Level Changes
by Anthony Hallam ..... (4) 935
Sedimentary Petrography
by A.V. Carozzi ..... (1) 156
The Geological Modelling of Hydrocarbon Reservoirs and Outcrop Analogues
edited by S.S. Flint and I.D. Bryant ..... (2) 419

CONTENTS INDEX TO VOLUME A64

Volume A64, No. 1, January 1994

THE EDITOR'S PAGE 1

ARTICLES

Provenance analysis of muddy sandstones ..... **Carol Bangs Rooney and Abhijit Basu** 2

Source versus depositional controls on sandstone composition in a foreland basin: the El Imperial Formation (mid-Carboniferous–Lower Permian), San Rafael Basin, western Argentina ..... **Irene S. Espejo and Oscar R. López-Gamundí** 8

Holocene and Paleogene arkoses of the Massif Central, France: mineralogy, chemistry, provenance, and hydrothermal alteration of the type arkose ..... **Peter C. van de Kamp, Kenneth P. Helmold, and Bernard E. Leake** 17

Antidunes and traction-carpet deposits in deep-water channel sandstones, Cretaceous, British Columbia, Canada ..... **Koji Yagishita** 34

The influence of lateral basinal slopes on turbidite sedimentation in the Annot sandstones of SE France ..... **H.D. Sinclair** 42

Carbonate pseudomatrix in siliciclastic-carbonate turbidites from the Oquirrh–Wood River Basin, southern Idaho ..... **Jeffrey K. Geslin** 55

Scaling in turbidite deposition ..... **Daniel H. Rothman, John P. Grotzinger, and Peter Flemings** 59

Downstream changes in the lithology and grain size of fluvial gravels, the Watarase River, Japan: evidence of the role of abrasion in downstream fining ..... **Yoshinori Kodama** 68

Experimental study of abrasion and its role in producing downstream fining in gravel-bed rivers ..... **Yoshinori Kodama** 76

The angular deviation of paleocurrent directions as applied to the calculation of channel sinuosities ..... **J.P. le Roux** 86

Origin of satin spar veins in evaporite basins ..... **Thomas C. Gustavson, Susan D. Hovorka, and Alan R. Dutton** 88

The occurrence of authigenic minerals in solid bitumens .. **J. Parnell, P.F. Carey, and S.H. Bottrell** 95

Paleoceanographic and paleoclimatic controls on ooid mineralogy of the Smackover Formation, Mississippi salt basin: implications for Late Jurassic seawater composition ..... **Ezat Heydari and Clyde H. Moore** 101

An ion microprobe study of diagenetic carbonates in the Devonian Nisku formation of Alberta, Canada ..... **Lee R. Riciputi, Hans G. Machel, and David R. Cole** 115

Numerical models of fluid flow in carbonate platforms: implications for dolomitization ..... **Jonathan Kaufman** 128

Irregular fenestrae in Bahamian eolianites: a rainstorm-induced origin ..... **Roger J. Bain and Pascal Kindler** 140

Environmental controls on the petrology of a late Holocene speleothem from Botswana with annual layers of aragonite and calcite .... **L. Bruce Railsback, George A. Brook, Jian Chen, Robert Kalin, and Christopher J. Fleisher** 147

BOOK REVIEWS 156

Other Recent Publications 157

ANNOUNCEMENTS 158

ERRATA 158

Volume A64, No. 2, April 1994

THE EDITOR'S PAGE 159

ARTICLES

Intracrystalline alteration of low-magnesian calcite cement in the Devonian Pillara Formation, Canning Basin, Western Australia ..... **Vicki A. Pedone, J.A.D. Dickson, and William J. Meyers** 160

The influence of sponge borings on aragonite-to-calcite inversion in Late Pleistocene *Strombus gigas* from Grand Cayman, British West Indies ..... **Jill Rehman, Brian Jones, T.H. Hagan, and M. Coniglio** 174

Water-rock interaction during meteoric flushing of a limestone: implications for porosity development in karstified petroleum reservoirs ... **P.C. Smalley, P.K. Bishop, J.A.D. Dickson, and D. Emery** 180

Nonmarine evaporitic sedimentation and associated diagenetic processes of the southwestern margin of the Ebro Basin (Lower Miocene), Spain ..... **Josep M. Salvany, Arsenio Muñoz, and Antonio Pérez** 190

Traction-carpet stratification in turbidites—fact or fiction? ..... **Richard N. Hiscott** 204

Loss of capacity, not competence, as the fundamental process governing deposition from turbidity currents ..... **Richard N. Hiscott** 209

Rock-type controls on downstream changes in clast parameters in sandur systems in southeast Iceland ..... **David Huddart** 215

Low depositional porosity in eolian sands and sandstones, Namib Desert ..... **Warren W. Dickinson and John D. Ward** 226

Deposits of deflected and ponded turbidity currents, Sorbas Basin, southeast Spain ..... **Peter D.W. Haughton** 233

Bed forms in submarine channels: comparison of ancient examples from Greece with studies of recent turbidite systems ..... **David J.W. Piper and N. Kontopoulos** 247

Flute-like marks and associated structures from the Carboniferous Port Hood Formation of eastern Canada: evidence of secondary origin in association with sediment intrusion ..... **Dave G. Keighley and Ron K. Pickerill** 253

Well preserved late Precambrian paleosols from northwest Scotland ..... **Gregory J. Retallack and Andrea Mindszenty** 264

Ripple marks in quartz arenites of the Hurwitz Group, Northwest Territories, Canada: evidence for sedimentation in a vast, early Proterozoic, shallow, fresh-water lake ..... **Lawrence B. Aspler, Jeffrey R. Chiarenzelli, and Terry L. Bursey** 282

Upper Proterozoic carbonate stratigraphy, diagenesis, and stromatolitic phosphorite formation, Irecê Basin, Bahia, Brazil ..... **Aroldo Misi and J. Richard Kyle** 299

Temperatures of quartz cementation in Jurassic sandstones from the Norwegian continental shelf—evidence from fluid inclusions ..... **Olav Walderhaug** 311

Precipitation rates for quartz cement in sandstones determined by fluid-inclusion microthermometry and temperature-history modeling ..... **Olav Walderhaug** 324

Quantification of quartz cements using combined SEM, CL, and image analysis ..... **Jonathan Evans, Andrew J.C. Hogg, Mark S. Hopkins, and Richard J. Howarth** 334

Petrographic and geochemical constraints on the formation and diagenesis of anhydrite cements, Smackover sandstones, Gulf of Mexico ..... **S.I. Dworkin and L.S. Land** 339

Differential mobility of elements in burial diagenesis of siliciclastic rocks ..... **Robert P. Wintsch and Cindy M. Kvale** 349

Petrographic, geochemical, and isotopic constraints on the provenance of the early Proterozoic Chelmsford Formation, Sudbury Basin, Ontario ..... **D.K. McDaniel, S.R. Hemming, S.M. McLennan, and G.N. Hanson** 362

Eruption-controlled epiclastic sedimentation in a Devonian trench-slope basin: evidence from sandstone petrofacies, Klamath Mountains, California ..... **E. Timothy Wallin and David W. Trabert** 373

Clay-mineral suites in cyclic Miocene sediments: a model for continental-margin deposition in a mixed siliciclastic-phosphatic-dolomitic-biogenic system ..... **Mead A. Allison and Stanley R. Riggs** 386

PERSPECTIVE

A reappraisal of dolomite abundance and occurrence in the Phanerozoic ..... **S. Qing Sun** 396

DISCUSSION

Early Devonian marine isotopic signatures: brachiopods from the Upper Gaspé limestones, Gaspé Peninsula, Québec, Canada

Discussion ..... **Nicholas R. Bates** 405

Reply ..... **Denis Lavoie** 408

The hydrogeochemistry of early meteoric diagenesis in a Holocene deposit of biogenic carbonates

Discussion ..... **David A. Budd** 412

Reply ..... **Michael E. McClain, Peter K. Swart, and H.L. Vacher** 415

Vaterite (an uncommon polymorph of $CaCO_3$): occurrences in boreholes demonstrate unexpected longevity

Discussion ..... **Ervin G. Otvos** 417

Reply ..... **Gerald M. Friedman and Douglas J. Schultz** 418

BOOK REVIEWS 419

OTHER RECENT PUBLICATIONS 420

ANNOUNCEMENTS 421

Volume A64, No. 3, July 1994

ARTICLES

Fine-sediment deposition from gravity surges on uniform slopes ..... **W. Brian Dade, John R. Lister, and Herbert E. Huppert** 423

Origins of the ice-contact stratified ridges (eskers) of Ireland ..... **William P. Warren and Gail M. Ashley** 433

Alluvial fans and their natural distinction from rivers based on morphology, hydraulic processes, sedimentary processes, and facies assemblages ..... **Terence C. Blair and John G. McPherson** 450

Basalt weathering and fluvial sedimentary particles: comparison of two watersheds in the Middle Atlas Mountains, Morocco ..... **J.J. Macaire, C. Cocirta, L. Karrat, and A. Perruchot** 490

Effects of tropical weathering on quartz grain shape: an example from northeastern Australia ..... **Kenneth Pye and Jim Mazzullo** 500

Combined-flow generation of sole structures, including recurved groove casts, associated with Lower Carboniferous lacustrine storm deposits in Nova Scotia, Canada ..... **A. Thomas Martel and Martin R. Gibling** 508

Modified-grain-flow deposits from the Upper Cretaceous Vallcarga Formation, south-central Pyrenees, Spain ..... **Jeroen D. Schuppers and Allard W. Martinius** 518

Pore-throat morphology in the Upper Jurassic Smackover Formation of Alabama ..... **David C. Kopaska-Merkel** 524

Oriented concretions, Ionian coast, Italy: evidence of groundwater flow direction ..... **E.F. McBride, M. Dane Picard, and R.L. Folk** 535

Burial diagenesis and pore-fluid evolution in a Mesozoic back-arc basin: the Marambio Group, Vega Island, Antarctica ..... **Duncan Pirrie, Peter W. Ditchfield, and Jim D. Marshall** 541

Authigenic chlorites in sandstones as indicators of high-temperature diagenesis, Arkoma foreland basin, USA ..... **Christoph Spötl, David W. Houseknecht, and Fred J. Longstaffe** 553

Cathodoluminescent textures and the origin of quartz silt in Oligocene mudrocks, South Texas ..... **Kitty L. Milliken** 567

Diagenesis of low-mobility elements (Ti, REES, TH) and solid bitumen envelopes in Permian Kennedy Group sandstone, Western Australia ..... **Birger Rasmussen and J.E. Glover** 572

Rare-earth element variation in phosphate nodules from midcontinent Pennsylvanian cyclothems ... **David L. Kidder and Carol A. Eddy-Dilek** 584

Origin and paleoenvironmental significance of calcite pseudomorphs after ikaite in the Oligocene Creede Formation, Colorado ..... **Daniel Larsen** 593

Geochemistry and crystal morphology of aragonite cements of mixing-zone origin, Barbados, West Indies ..... **Tod N. Kimbell and John D. Humphrey** 604

An example of mixing-zone dolomite, Middle Eocene Avon Park Formation, Floridan aquifer system ..... **Harris S. Cander** 615

Dolomitization kinetics in hydrothermal bombs and natural settings ..... **Duncan F. Sibley, Stephan H. Nordeng, and Michelle L. Borkowski** 630

Origin of dolomite in the phosphatic Miocene Hawthorn Group of Florida ..... **John S. Compton, Donald L. Hall, David J. Mallinson, and David A. Hodell** 638

Needle-fiber calcite : a critical review and a proposed classification ..... **Eric P. Verrecchia and Karin E. Verrecchia** 650

RESEARCH METHODS PAPERS

High-resolution X-radiography of laminated sediment cores ..... **Thomas J. Algeo, Mark Phillips, Jacek Jaminski, and Matthew Fenwick** 665

A rapid technique for the determination of dry sediment mass from saturated marine sands ..... **Carl L. Amos and Terri Sutherland** 668

Accurate determination of reduced sulfur and major elements by fused glass X-ray fluorescence analysis ..... **David N. Awwiller** 670

A new standard method of impregnation using crystic resin ..... **S.P. Belbin** 673

A high-resolution ultrasonic bed profiler for use in laboratory flumes .. **Jim Best and Phil Ashworth** 674

Mounting samples in methyl methacrylate polymer for SEM and EMP studies ..... **Yvonne L. Douma and John B. Knight** 675

Quick estimation of pebble volumes ..... **Sören B. Dürr** 677

A method for studying diagenesis in shallow sediments using flow-through columns ..... **Alan E. Fryar and Franklin W. Schwartz** 679

Improved coring device for measuring soil bulk density in a Louisiana deltaic marsh ..... **Thomas G. Hargis and Robert R. Twilley** 681

A multi-depth probe for measuring oxidation-reduction (redox) potential in wetland soils ..... **Thomas G. Hargis and Robert R. Twilley** 684

An improved cover-slip holder for preparing microslides of randomly distributed particles ..... **David Lazarus** 686

The isolation of settling-velocity fractions of sand-size material: new possibilities for the settling tube technique ..... **Reinhard Oehmig and Klaus H. Michels** 687

X-ray computed tomography: a nondestructive method for quantitative analysis of sediment cores .. **Thomas H. Orsi, Carl M. Edwards, and Aubrey L. Anderson** 690

A method for the determination of nitrogen in clays, with application to the burial diagenesis of shales **Paul A. Schroeder and Ellery D. Ingall** 694

Low-temperature heating of shale and clay samples may reduce the efficiency of procedures designed to remove iron oxides **Brian T. Sheldon and Otto C. Kopp** 698

A simple and effective method for portraying and quantifying the macropetrography of lignites: a new tool for coal seam facies analysis **Richard Sykes and Ken C. Pratt** 699

A new system for high-magnification thermometric studies of fluid inclusions in diagenetic minerals **Jamie J. Wilkinson** 701

DISCUSSION

Shape sorting during wind transport of quartz silt grains

Discussion **Kenneth Pye** 704

Pot and gutter casts from the Chapel Island Formation, southeast Newfoundland

Discussion **Greg H. Browne** 706

Reply **Paul M. Myrow** 708

ANNOUNCEMENTS 710

Volume A64, No. 4, October 1994

ARTICLES

Facies and evolution of a Silurian coral-microbialite reef complex, Maumee, Ohio, USA **Charles F. Kahle** 711

Evidence for a paleoaquifer from early diagenetic siderite of the Cardium Formation, Alberta, Canada **Geoffrey D. Thyne and Cynthia J. Gwinn** 726

Sedimentology and geochemistry of lowstand peritidal lithofacies at the Cenomanian–Turonian boundary in the Cretaceous carbonate platform of Israel **Ron Bogoch, Binyamin Buchbinder, and M. Magaritz** 733

Golden Grove Dolomite, Barbados: origin from modified seawater **Hans G. Machel and Elizabeth A. Burton** 741

Growth and structure of fringing reefs in a muddy environment, south Thailand **Alexander W. Tudhope and Terence P. Scoffin** 752

Proterozoic glauconitic peloids from South India: their origin and significance **Asru K. Chaudhuri, S.K. Chanda, and Somnath Dasgupta** 765

Biogeochemistry and origin of a phosphoritized coprolite from anoxic sediment of the Santa Barbara Basin **Arndt Schimmelmann, Jeffrey D. Schuffert, M. Indira Venkatesan, Jim Leather, Carina B. Lange, Gleb N. Baturin, and Alain Simon** 771

Multiple authigenesis of K-feldspar in sandstones: evidence from the Cretaceous Areado Formation, São Francisco Basin, central Brazil **L.F. De Ros, G.N.C. Sgarbi, and S. Morad** 778

Elemental mobility in sandstones during burial: whole-rock chemical and isotopic data, Frio Formation, South Texas **K.L. Milliken, L.E. Mack, and L.S. Land** 788

Porosity reduction and major controls on diagenesis of Cretaceous–Paleocene volcaniclastic and arkosic sandstone, Middle Park Basin, Colorado **Robert R. Remy** 797

Paleogeographic influences on sandstone composition along an evolving passive margin: an example from the basal Chilhowee Group (uppermost Proterozoic to Lower Cambrian) of the south-central Appalachians **Dan Walker, Edward L. Simpson, and Steven G. Driese** 807

Sandstone petrology and provenance of the Siwalik Group (northwestern Pakistan and western-southeastern Nepal) ..... **Salvatore Critelli and Raymond V. Ingersoll** 815

Detrital modes and provenance of Miocene sandstones and modern sands of the southern Apennines thrust-top basins (Italy) ..... **Salvatore Critelli and Emilia Le Pera** 824

Petrography and geochemistry of sandstones interbedded with the Rooiberg Felsite Group (Transvaal Sequence, South Africa): implications for provenance and tectonic setting ..... **P.G. Eriksson, U.M. Schreiber, B.F.F. Reczko, and C.P. Snyman** 836

Microfabric and taphonomic analysis in determining sedimentary processes in marine mudstones: example from Silurian of New York .... **Neal R. O'Brien, Carlton E. Brett, and Wendy L. Taylor** 847

Virgilian (Upper Pennsylvanian) paleosols in the upper Lawrence Formation (Douglas Group) and in the Snyderville Shale Member (Oread Formation, Shawnee Group) of the northern midcontinent, USA: pedologic contrasts in a cyclothem sequence ..... **R.M. Joeckel** 853

Subaqueous pyroclastic deposits in an Ordovician fore-arc basin: an example from the Saint-Victor Formation, Quebec Appalachians, Canada ..... **Pierre A. Cousineau** 867

New evidence for the Holocene sea-level high from the inner shelf, central Great Barrier Reef, Australia ..... **R. Beaman, P. Larcombe, and R.M. Carter** 881

Landward migration of isolated shelly sand ridge (chenier) on the macrotidal flat of Gomso Bay, west coast of Korea: controls of storms and typhoon ..... **Hee Jun Lee, Seung Soo Chun, Jin Ho Chang, and Sang-Joon Han** 886

Gravel and sand flotation: a sediment dispersal process important in certain nearshore marine environments ..... **Per Möller and Ólafur Ingólfsson** 894

Observations on experimental, nonchannelized high-concentration turbidity currents and variations in deposits around obstacles ..... **Jan Alexander and Stephen Morris** 899

Fabric shape and the interpretation of sedimentary fabric data ..... **Douglas I. Benn** 910

Grain-shape indices and isometric graphs ..... **H.J. Hofmann** 916

DISCUSSION

Great Bahama Bank aragonitic muds: mostly inorganically precipitated, mostly exported
Discussion ..... **Gerald M. Friedman** 921
Reply ..... **John D. Milliman** 922

Identification and diagenesis of a phylloid alga: *Archaeolithophyllum* from the Pennsylvanian Providence Limestone, western Kentucky
Discussion ..... **Nicholas E. Pingitore, Jr.** 923
Reply ..... **Stephen O. Moshier and Brenda L. Kirkland** 925

Mudstone lithofacies in the Kimmeridge Clay Formation, Wessex Basin, southern England: implications for the origin and controls of the distribution of mudstones
Discussion ..... **Paul B. Wignall** 927
Reply ..... **J.H.S. Macquaker and R.L. Gawthorpe** 930

Scaling in turbidite deposition
Discussion ..... **Richard N. Hiscott and John V. Firth** 933
Reply ..... **Daniel H. Rothman, John P. Grotzinger, and Peter B. Flemings** 934

BOOK REVIEWS 935

OTHER RECENT PUBLICATIONS 936

ANNOUNCEMENTS 937

INDEX TO VOLUME A64

Author Index 940

Subject Index 943

Book Review Index 945

Contents Index 946